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# URGENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Via facsimile (703) 872-9306 and USPS

Re: Patent Application No. 10/622,542 "High-dimensional data clustering with the use of hybrid similarity matrices"; Examiner: Diane D. Mizrahi.

AMENDMENT OF CLAIM IN RESPONSE TO OFFICE ACTION dd 05/06/2005

Dear Commissioner for Patents:

Applicant hereby corrects Claim 7 as presented in the attached claim listing with markings and a clean version.

Very truly yours,

Leonid Andreev
Applicant

Encl.: 1. Marked-up version of claims (2 pages)
2. Clean version of claims (2 pages)

**Claims 1 – 6 (original)**

1. A computer-based method for computation of similarity matrices of objects in a high-dimensional space of attributes with the purpose of clustering, allowing for fusion of different attributes (parameters) on a dimensionless basis, comprising the steps of:

a) computation of similarity matrices for each of attributes (parameters) individually, such matrices being monomer similarity matrices;

and

b) hybridization of all monomer similarity matrices into one hybrid matrix which is further used in clustering process.

2. The method of claim 1 wherein said hybridization of monomer similarity matrices is performed so that all similarity coefficients in monomer similarity matrices for one and the same pair of objects are averaged through computation of their geometric (arithmetic) means.

3. The method of claim 1 wherein each of monomer similarity matrices used in computation of a hybrid matrix is computed with the use of a metric that most optimally suits a respective attribute (parameter).

4. The method of claim 3 wherein a choice of metrics used in computation of monomer similarity matrices for further hybridization into a hybrid matrix depends on

whether a respective attribute (parameter) describes a shape or power of an object.

5. The method of claim 4 wherein attributes (parameters) should be treated either as those describing a shape or as those describing a power, depending on a problem to be solved by clustering analysis.

6. The method of claim 4 wherein monomer similarity matrices based on attributes (parameters) describing shapes of objects are computed with the use of a metric representing a ratio of a lesser value to a greater value of exponential functions in which a base is a constant > 1 and an exponent is a value of a respective parameter.

**Claim 7 (currently amended):**

7. The method of claim 4 wherein monomer matrices based on attributes (parameters) describing power of objects are computed with the use of a metric representing a ratio of a lower value of a parameter to ((its)) a higher value of the same parameter.

**Claim 8 (original):**

8. The method of claim 1 wherein each and any of said monomer matrices may be multiplied and added to a hybrid matrix in an indefinite number of extra copies.

1. A computer-based method for computation of similarity matrices of objects in a high-dimensional space of attributes with the purpose of clustering, allowing for fusion of different attributes (parameters) on a dimensionless basis, comprising the steps of:

a) computation of similarity matrices for each of attributes (parameters) individually, such matrices being monomer similarity matrices;

and

b) hybridization of all monomer similarity matrices into one hybrid matrix which is further used in clustering process.

2. The method of claim 1 wherein said hybridization of monomer similarity matrices is performed so that all similarity coefficients in monomer similarity matrices for one and the same pair of objects are averaged through computation of their geometric (arithmetic) means.

3. The method of claim 1 wherein each of monomer similarity matrices used in computation of a hybrid matrix is computed with the use of a metric that most optimally suits a respective attribute (parameter).

4. The method of claim 3 wherein a choice of metrics used in computation of monomer similarity matrices for further hybridization into a hybrid matrix depends on whether a respective attribute (parameter) describes a shape or power of an object.

5. The method of claim 4 wherein attributes (parameters) should be treated either as those describing a shape or as those describing a power, depending on a problem to be solved by clustering analysis.

6. The method of claim 4 wherein monomer similarity matrices based on attributes (parameters) describing shapes of objects are computed with the use of a metric representing a ratio of a lesser value to a greater value of exponential functions in which a base is a constant > 1 and an exponent is a value of a respective parameter.

7. The method of claim 4 wherein monomer matrices based on attributes (parameters) describing power of objects are computed with the use of a metric representing a ratio of a lower value of a parameter to a higher value of the same parameter.

8. The method of claim 1 wherein each and any of said monomer matrices may be multiplied and added to a hybrid matrix in an indefinite number of extra copies.